

# STUDIES OF ACTINIDE COLLOIDS IN HIGH-IONIC STRENGTH GROUNDWATERS. B.

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Proposed plans for permanent disposal of transuranic wastes in geologic repositories require the development of an actinide source-term model that predicts the total concentrations of mobile actinides in both the near field and far-field environments. An actinide source-term model must quantify mobile actinide-bearing species, which may be present as dissolved species in several possible oxidation states or as suspended colloidal particles.

In this presentation, we describe results of experiments with several actinides in Na-Ca-Mg-Cl-SO<sub>4</sub> brines with ionic strengths ranging from 0.8 to 8 molal, designed to assess the formation of intrinsic colloids (Eigenkolloide or real colloids), and their temporal behavior (e.g., changes in concentration and size). We have implemented a test matrix that provides us with the basis to understand the behavior of actinides with +3, +4, +5, and +6 oxidation states, as a function of pH (3 to 11) and actinide concentration ( $10^{-8}$ – $10^{-4}$  molar). Colloid sizes were estimated using sequential filtration and ultrafiltration techniques. Colloidal particles were characterized with scanning electron microscopy and energy-dispersive X-ray spectrometry. The oxidation states of the actinides were investigated with absorption spectroscopy.

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